

Remarks

Claims 1, 2, and 4-24 were pending in the above-identified application. By way of the present amendment, Applicants have cancelled claims 13 and 23, and have amended claims 11, 14 and 21. Claims 1, 2, 4-12, 14-22 and 24 are therefore currently pending and under examination. Applicants respectfully request reconsideration and allowance of the pending claims in view of the amendments and the remarks provided herein.

35 U.S.C. §103 rejection based on Overlapping Ranges

Claims 11, 12, 15, 17, 18, and 21 were rejected under 35 U.S.C. §103 over Chen (US 5,925,395), with the rejection of claim 21 being made further in view of Gawad *et al.* and Chen (US 5,939,117). The Examiner is asserting that the indicated claims are *prima facie* obvious because the compositional proportions taught by Chen overlap the claimed proportions. Applicants respectfully traverse the rejection. Nonetheless, in the interest of furthering prosecution, Applicants have amended claims 11 and 21 to recite magnesium ion concentrations previously found in dependent claims 13 and 23, respectively. Because Chen does not describe the use of magnesium ions, Applicants respectfully request that the rejection of claims 11, 12, 15, 17, 18, and 21 as being *prima facie* obvious over Chen be withdrawn.

35 U.S.C. §103 rejections including Vogel *et al.* and Hekal *et al.*

Claims 1, 2, 4, 5, 7, 8, 13, and 14 are rejected under 35 U.S.C. §103 as being unpatentable over Chen in view of Vogel *et al.* and Hekal *et al.* The rejection of claims 6, 9, 10, 16, 19, 20, 23, and 24 is also made in view of Vogel *et al.* and Hekal *et al.* Applicants respectfully traverse the rejection.

The Examiner has asserted that Chen discloses a preservative solution where the molar ratio between ascorbic acid/ions and calcium salt/ions is from 0.5:1 to 4:1, but that Chen does not disclose magnesium ions or the weight ratio between magnesium and calcium ions. However,

Vogel *et al.* and Hekal *et al.* have been recited as providing magnesium ions, and the Examiner asserts that the proportions of magnesium and calcium ions necessary to avoid an undesirable taste would have been obvious. Applicants respectfully traverse the rejections.

As Vogel *et al.* has not been previously cited, Applicants first turn to an analysis of this reference. Vogel *et al.* describes a water purification and dispensing apparatus that purifies water *in situ* and includes a mineral addition system. Vogel *et al.* further states that the minerals added are preferable calcium chloride, potassium chloride, and magnesium chloride, preferably at a weight ratio of 60:20:20, and that they are injected at a level to bring the dissolved solids in the mineralized water up to 100 ppm. While Vogel *et al.* clearly recited the use of magnesium, Vogel *et al.* does not supply the ratios or amounts of magnesium salts or ions recited in the claims and describes their use in a very different context. Vogel *et al.* describes a ratio of 60:20 (*i.e.*, 3:1) for calcium to magnesium salt. Claim 1, on the other hand, recites a ratio from about 5.4:1 and about 11.3:1 between the calcium ions and magnesium ions, which is entirely outside the range described by Vogel *et al.* Furthermore, 100 ppm of minerals is substantially below the level of minerals (*e.g.*, magnesium) that are presently claimed. Even assuming that all of the minerals added were magnesium salts, this only provides a level of 100 ppm of magnesium, which represents an amount of only 0.0001 w/w of magnesium in solution. This is substantially less than the range of 0.06% and 0.10% (w/w) recited in claim 11, and even less than the amount of about 0.5% (w/w) recited in claim 21. Accordingly, Vogel *et al.* does not provide the ratios or amounts of magnesium ions recited in the claims.

Vogel *et al.* also does not provide the motivation to modify Chen or provide magnesium and calcium ions in proportions that would avoid an unpleasant taste. The Examiner has indicated that Vogel *et al.* describes use of the purified water for misting vegetables. However, the misting of vegetables is described for use in a grocery store, where such misting is carried out to prevent dehydration of the vegetables rather than apply a preservative solution. Vogel *et al.* makes no reference to use of the purified water for preserving fruit or vegetables. Furthermore, Vogel *et al.* describes adding a small amount of minerals (much smaller than those presently

claimed) to improve the taste of the purified water. This represents an avoidance of the poor taste of demineralized water, which is well known to have a flat taste. This exactly the opposite of the problem solved by the present invention, which is directed at avoiding the bitter taste that can be caused by excess mineral (e.g., calcium salt) levels. Accordingly, Vogel *et al.* does not provide the motivation to modify Chen to provide a preservative solution that avoids bitter taste in part by decreasing calcium salt levels.

The Examiner further argues that it would have been obvious to adjust the ratio of calcium and magnesium in order to provide a preservative solution that contains minerals in amounts that do not negatively affect the taste of the preservative. However, none of the references recited by the Examiner suggest that ratio of calcium and magnesium ions should be varied to avoid a bitter taste, or for that matter the brightness and brilliance of apple surfaces that is provided by magnesium. "A particular parameter must first be recognized as a result-effective variable, *i.e.*, a variable which achieves a recognized result, before the determination of the optimum or workable ranges of said variable might be characterized as routine experimentation." *In re Antonie*, 559 F.2d 618, 195 USPQ 6 (CCPA 1977) Accordingly, because the ratio of calcium and magnesium ions was not understood to be a result-effective variable, adjusting that ratio is not a routine and obvious measure to obtain the claimed invention.

The Examiner's current arguments focus primarily on Vogel *et al.* with regard to magnesium ions. However, Hekal *et al.* is also included in the rejection. As previously noted by Applicants, Hekal *et al.* provides alternatives to the use of calcium ions for preserving fresh produce, and does not therefore consider the combined use of calcium and magnesium. Furthermore, Applicants note that the Examiner has indicated that Applicants arguments against the obviousness of claims reciting magnesium in view of Chen, Hekal *et al.*, and Gawad *et al.* were found to be persuasive, and that new arguments were only made based on the addition of Vogel *et al.* Accordingly, in view of the defects of Vogel *et al.*, as described above, Applicants respectfully request that the rejection of the claims under 35 U.S.C. §103 over Chen in view of Hekal *et al.* and Vogel *et al.* be withdrawn.

35 U.S.C. §103 rejections of claims 11-24; Response to Arguments

Applicants have previously argued that the claimed preservative solutions of claims 11-24 provide unexpected results which rebut the Examiner's assertion of obviousness. Independent claims 11 and 21 recite ascorbic acid concentrations ranging from 5 to 9% (w/w) and 5.6% to 9% (w/w), respectively, whereas Chen recites ascorbic acid concentrations from about 0% to about 30%, about 0.1% to about 30%, about 0.1% to about 20%, about 0.5% to about 15%, and from about 1% to about 5%. In the Response to Arguments, the Examiner has asserted that Applicants have asserted unexpected results without defining the results or providing evidence of the results. Applicants respectfully disagree.

The present application states in paragraph [0035] that "high levels of ascorbic acid (5.6 to 9% (w/v)) in the dip solution are beneficial for the effective ascorbic acid chelation of Ca ions which results in the transport and even distribution of Ca ions throughout the apple pieces." The even distribution of calcium resulting from use of this concentration of ascorbic acid avoids excessive concentrations of calcium near the surface, which can result in skin toughness, and helps maintain the firmness and crispness of the stored cut apple pieces. To Applicants knowledge, the benefit of 5-9% concentrations of ascorbic acid for evenly distributing and transporting calcium through apple tissue was not known in the prior art, and is an unexpected benefit from using the claimed amount of ascorbic acid. This unexpected result is supported by Examples provided in the specification, and is not mere attorney argument. Furthermore, this unexpected result rebuts the *prima facie* case of obviousness resulting from the overlapping ascorbic acid concentrations recited in Chen.

The Examiner further asserts that because Chen acknowledges that the preservative of its invention maintains the freshness, crispness, texture, appearance, color, moisture, and flavor of produce, that this implies that one practicing the invention will select proportions of ascorbic acid to calcium and amounts that maintain preservative effect while not imparting an undesirable taste. It is improper to suggest that one practicing an invention will be able to select proportions

suitable to provide a desired effect when the specification does not provide such guidance. While Chen is presumed to be valid over the scope of its claims, this does not presume that unclaimed and relatively indefinite aspects such as freshness, crispness, texture, appearance, color, moisture, and flavor will be provided at preferred levels over the scope of the claims. Furthermore, what guidance Chen does provide is only relevant to vegetable preservatives. The specification of Chen refers only to vegetables, and the examples are all directed to vegetables. The effect of the presently claimed ascorbic acid levels, on the other hand, are specifically directed to cut apple pieces (with different effects on the skin and inner tissue being noted), which are significantly different from vegetable pieces. Accordingly, the description of a wide variety of ascorbic acid ranges for use on vegetables in Chen does not render obvious the particular ranges of claims 11-24, which provide unexpected results when applied to apple pieces.

The Examiner has also made additional rejections of dependent claims based on Gawad *et al.* and Warren *et al.*, pertaining to particular sources of calcium and the use of a pH adjuster. Applicants respectfully traverse these rejections, but do not provide particular arguments herein as the effect of these references on the dependent claims is moot in view of the arguments regarding the independent claims provided above.

In view of the above-described amendments and remarks, Applicants submit that claims 1, 2, 4-12, 14-22 and 24 are in condition for allowance, and respectfully requests same. The Examiner is asked to contact the undersigned at the phone number listed below if there are any questions regarding the amendments or remarks provided herein.

Respectfully submitted,

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